INSTITUT C.D. HOWE INSTITUTE

COMMENTARY
NO. 405

Evaluating Public-Sector Pensions: Are Federal Public Servants Overpaid?

Part II of a two-part series examining the real problems of public-sector pension plans and how to fix them.

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Commentary No. 405
April 2014
Pension Policy

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Vice-President, Research

$12.00
ISBN 978-0-88806-926-9
ISSN 0824-8001 (print);
ISSN 1703-0765 (online)

The Study In Brief

The federal government appears to believe that pay in the federal public sector should be comparable to pay in the private sector on a total compensation basis. Two recent government reports are generally consistent with this view.

To implement this principle, pensions must be valued appropriately. Fair values are the best measure of a pension plan's worth in a transaction where employees provide their labour in exchange for compensation that includes a valuable pension. However, governments appear not to apply fair value principles, preferring instead to use cost estimates developed for the funding of pension plans or for financial reporting in accordance with public-sector accounting standards. While the differences between fair values and funding estimates were not significant in the 1980s and 1990s when interest rates were high, the differences today are exceedingly large.

It is undeniably more convenient for the federal government to continue to use the numbers it has been using. But it is also wrong, for to do so is to collectively guarantee federal employees a 4.1 percent real rate of return on their retirement savings at a time when other Canadians must accept a 1 percent guarantee if they seek one or, alternatively, must bear significant investment risks in pursuit of a 4.1 percent real rate of return.

These guarantees are very advantageous yet public-sector accounting standards attach no value to them and the federal government appears to ignore them when assessing the reasonableness of employee compensation.

The payroll for members of the federal Public Service Pension Plan was about $20 billion in 2012, with pension contributions totaling about $4 billion. At fair market value, pension contributions would have been about $8 billion. As a consequence, the federal government underestimated the 2012 compensation of these members by $4 billion and reached a long list of erroneous conclusions about the cost of its pension plans and the compensation of its employees.

How can this be? The culprits appear to be actuarial and accounting standards that are incompatible with market prices and designed for purposes other than compensation management. Actuarial and accounting standards do not explicitly advocate or endorse the use of funding or accounting numbers in compensation studies but the standards-setting bodies and the professionals involved know, or ought to know, that numbers prepared for one purpose are being used for other purposes to which they are ill-suited. In this sense, actuarial and accounting standards have become the enablers of bad financial practice even though the standard-setting bodies do not advocate or condone bad practice.

Given the amounts involved something should be done about this – and done soon.

C.D. Howe Institute Commentary© is a periodic analysis of, and commentary on, current public policy issues. Michael Benedict and James Fleming edited the manuscript; Yang Zhao prepared it for publication. As with all Institute publications, the views expressed here are those of the author and do not necessarily reflect the opinions of the Institute's members or Board of Directors. Quotation with appropriate credit is permissible.

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This paper applies the concepts developed in my previous *Commentary* – "Evaluating Public-Sector Pensions: How Much Do They Really Cost?" – to the pension plan for the Public Service of Canada,[1] hereinafter referred to as the Public Service Pension Plan or PSPP.

I chose to analyze the PSPP not because it is typical or representative of Canada's public-sector pension plans, but because it is the largest such plan (with more than 300,000 active and 170,000 retired members) and because it is the pension plan about which the most is known. In particular, the PSPP's triennial actuarial reports since 1947 are available on the Office of the Chief Actuary's website.[2]

In 2006, the federal government released a comprehensive examination of compensation policy in the federal public sector known as the *Expenditure Review of Federal Public Sector Compensation Policy and Comparability* (Lahey 2006). Called the *Lahey Report* after its principal author, long-time senior federal public servant James Lahey, it compared the compensation of federal public servants to that of similarly qualified and engaged employees in the private sector. As a consequence, more is known about compensation levels, measurement and management in the federal public service than elsewhere in the public sector.

In my earlier *Commentary* I described the principles that should guide the measurement of pension costs for compensation management purposes and concluded that the fair value of the guarantees embedded in defined-benefit (DB) pension plans such as the PSPP should be taken into account in evaluating pension costs and in setting compensation levels. The federal government appears to ignore the cost of these guarantees despite the statutory – not to mention the moral – obligation to pay the pensions.

The fair value of the pensions earned by federal public servants is much higher today than is publicly acknowledged. As a consequence, they are paid more than their private-sector counterparts and are better able to shelter their retirement savings from tax. If pension guarantees had been valued at fair value and properly reflected in employee compensation, the rising cost of these guarantees as interest rates declined during the last 15 years would have triggered a thoughtful reconsideration of the PSPP's design.

The conclusions presented in this *Commentary* apply only to the PSPP. They cannot be extended to other public-sector pension plans without qualification and/or modification. In particular, they cannot be extended to pension plans where risks are shared between members and employers, as is common in the provincial public sector.

The author wishes to thank Alexandre Laurin, members of the C.D. Howe Institute's Pension Policy Council and other anonymous reviewers for their comments on earlier versions of this *Commentary*. He also wishes to thank Michael Benedict and James Fleming for their editing. As a partner at Mercer, the author provided advisory services to various private- and public-sector pension plans and served as a member of the Actuarial Standards Board.

1 The federal government also sponsors pension plans covering employees of the RCMP, the armed forces, judges and Members of Parliament.

2 http://www.osfi-bsif.gc.ca/Eng/oca-bac/ar-ra/psc-fpc/Pages/default.aspx.

1. The Public Service Pension Plan

The PSPP delivers the benefits conferred on employees by the *Public Service Superannuation Act*, the *Special Retirement Arrangements Act* and the *Pension Benefits Division Act*. The plan covers employees of the federal government other than those whose pensions are provided by separate statutes.

The PSPP pays pensions up to the limits imposed by the *Income Tax Act* (*ITA*) for registered pension plans as well as pensions over the *ITA* limits, the latter delivered through Retirement Compensation Arrangements (RCAs).[3]

Registered pensions for service up to April 1, 2000 are supported by a superannuation account established and maintained for that purpose. The superannuation account is unfunded; for accounting purposes it is notionally invested in 20-year Canada bonds, one maturing each year.

Registered pensions for service on or after April 1, 2000 are delivered through a pension fund. The Public Service Pension Investment Board (PSPIB) manages the fund's investments. The fund is currently invested in a diversified portfolio of bonds, global equities and alternatives.[4]

For each year of pensionable service, the PSPP pays a pension equal to 2 percent of a member's average earnings in the best five consecutive years of employment. Pensions are integrated with C/QPP benefits and are fully indexed. A 50 percent survivor pension is paid to eligible surviving spouses.

Pensions are payable without reduction upon retirement after age 60 or, for those who have completed 30 years of service, after age 55. For federal public servants hired after December 31, 2012, the references to ages 55 and 60 in the preceding sentence should be to ages 60 and 65, respectively.

Member contribution rates have been increasing for some time and will continue to do so (See Table 1). The contribution rates are prescribed until the end of 2016. The 2017 and 2018 rates are the Chief Actuary's estimates of what will be required to achieve a 50/50 sharing of the current service cost by 2018.

It is important to note that the 50/50 cost-sharing envisioned by the federal government is not the same as the 50/50 cost-sharing found in many of the provinces. The federal government proposes to divide only the current service cost between plan members and the government. Ottawa will remain fully responsible for funding pension deficits and, at least in theory, will be able to use surpluses to reduce future contributions. Thus, there will be cost-sharing but not risk-sharing.[5]

The fact that employee contribution rates will have increased by about 5 percent of pay between 2005 and 2018 does not mean that there has been any sharing of risk. Employees are being asked to pay a greater share of the cost of benefits accruing in the future; they have not been asked to accept responsibility for shortfalls arising from the funding of the pensions they have already earned. Plans like the Ontario Teachers' Pension Plan and the Ontario Municipal Employees Retirement System (OMERS), to name two, share both cost and risk with plan members. When contribution rates must be increased to address deficits, employees collectively pay one-half of the additional

3 RCAs do not enjoy the advantageous tax treatment reserved for registered pension plans.

4 "Alternatives" refers to non-traditional pension investments, including real estate, private equity, infrastructure and commodities.

5 To be clear, there is no sharing of risk as it relates to the uncertain cost of paying the benefits already promised to members for past service.

Table 1: Employee Contribution Rates to the PSPP

Year	Earnings up to the YMPE* (*Percent*)	Earnings over the YMPE (*Percent*)
2003-2005	4.00	7.50
2006	4.30	7.80
2007	4.60	8.10
2008	4.90	8.40
2009	5.20	8.40
2010	5.50	8.40
2011	5.80	8.40
2012	6.20	8.60
2013	6.85	9.20
2014	7.50	9.80
2015	8.10	10.40
2016	8.80	11.00
2017	9.47	11.58
2018	9.52	11.65

* Year's Maximum Pensionable Earnings (for the Canada/Quebec Pension Plans).
Source: Treasury Board of Canada Secretariat and OCA (2013).

contributions in addition to paying one-half of the current service cost.

2. Pensions and Compensation in the Federal Public Sector

In 2004 the Treasury Board Secretariat launched a review of compensation in the federal public sector. In November 2006, the *Lahey Report* set out the findings and recommendations of what it described as the "first ever comprehensive description and analysis of compensation in the federal public sector." The 508-page report found that the 351,000 federal public servants employed during the 2002/2003 fiscal year received wages and salaries totalling $18 billion and other compensation (pensions and benefits) worth $7 billion.

The report acknowledged that:

> The federal government, like other public-sector employers, is responsible as well to Canadians both as citizens and taxpayers. In this context, the federal employer must ensure that its compensation regime is fair to the public, providing reasonable value at a reasonable cost, today and into the future.

Fairness was to be judged by comparing total compensation to the private sector.

> The proper standard for fair compensation is comparability with appropriate comparators in the Canadian private sector.

Perhaps the report's most surprising conclusion was that public-sector wages and salaries (excluding pensions and benefits) were slightly higher than in the private sector.

> Available data suggest that in 2003 there was likely a small premium in favour of federal public-sector salaries versus those paid in the Canadian private sector.

For decades, Ottawa had countered criticism that its pension plans were too costly by claiming that large pensions were required to partially compensate federal employees for uncompetitive salaries. The *Labey Report* found that while this may have been true in the 1980s and 1990s, it was no longer true in the 2000s. In other words, the federal public sector was overpaid in 2002 once the high costs of pensions and benefits were taken into account.

> Overall, employees in the lower ranks of the federal public service enjoy advantageous compensation, especially if they work outside major metropolitan areas. They enjoy salaries that are well ahead of the private sector on average, an exceptional pension plan and solid benefits, as well as strong job security. For middle-level public servants, salaries are more likely to be in line with those of private-sector counterparts. In any case, when the public service pension plan, other benefits and relative job security are taken into account, their overall compensation is attractive.

Only at the highest levels did compensation in the federal public sector lag compensation in the private sector.

The *Labey Report* acknowledged that there were large differences between public- and private-sector pensions but made no attempt to quantify these differences. Thus, while the report concluded that the federal public sector was overcompensated in 2003, it did not estimate the extent of this overcompensation.

3. The Fair Value of PSPP Benefits

The *Labey Report* used the Chief Actuary's calculation of the current service cost of the PSPP, expressed as a percentage of salary, to value pensions. The Chief Actuary's calculation appears to have been chosen because it was:

- readily available;
- used to determine the government's contributions to the PSPP; and
- also used, with minor modifications, to determine the government's annual pension expense in accordance with public-sector accounting standards.

The current service cost for the 2002/2003 fiscal year was taken from the PSPP actuarial report effective March 31, 1999 (the 1999 Report; OCA 2001). This report was presented to Parliament in September 2000 and was used to set contributions for the fiscal years ending in 2001, 2002 and 2003.

The 1999 report was the first to develop a current service cost for pensions accruing after April 1, 2000, under the revised funding arrangements. For this purpose the Chief Actuary assumed that the pension fund would earn a 4.25 percent real rate of return in the long term, not much different from the 4.1 percent real rate of return used in the 2011 report. This 4.25 percent rate was quite close to the 4.2 percent yield on long-term Real Return Bonds (RRBs) on March 31, 1999, although this was entirely coincidental as the Chief Actuary was, then as now, not influenced by bond yields in formulating his long-term assumptions.

By March 31, 2002 – the start of the fiscal year that was the focus of the *Labey Report* – RRB yields had declined to 3.7 percent, still relatively close to the rate that the Chief Actuary and the government were using to measure pension costs. As interest rates declined during the next 10 years, the current

service costs reported in successive actuarial reports drifted farther and farther from fair value.

The 2011 Report (OCA 2012), as subsequently revised to take recent plan amendments into account, is being used to determine pension contributions for the 2013, 2014 and 2015 calendar years. Current service costs are being determined using an assumed 4.1 percent real rate of return, compared to long-term RRB yields that were 1.1 percent on March 31, 2011 and that subsequently dropped as low as 0.3 percent before bouncing back to around 1 percent today.

Table 2 compares the current service cost, as calculated for 2017 in the 2011 report, to the fair values of pensions calculated at the market interest rates that were in effect on March 31 of fiscal years between 2002 and 2013 inclusive.[6]

When the *Lahey Report* looked at federal public-sector compensation in the 2002/2003 fiscal year, the difference between Ottawa's PSPP cost estimate and fair value was about 2 percent of pay. Today the situation is decidedly different. The gap between fair value and the government's estimates has ballooned from 2 percent of pay to between 20 percent and 30 percent of pay, yet there is nothing in the government's behaviour to suggest that it is aware of the problem or prepared to do anything about it. Instead, hiding behind funding calculations that are inappropriate for estimating compensation costs and behind public-sector accounting standards that are incompatible with private-sector standards, the federal government is making only minor changes to a plan that needs much more.

By using the Chief Actuary's funding estimates to guide compensation policy, Ottawa sets compensation on the assumption that the PSPP is worth 20 percent of pay. As discussed in Section 6 of my earlier *Commentary*,[7] this means that federal employees are collectively being promised a 4.1 percent real rate of return on their deferred compensation. Guaranteeing a 4.1 percent real rate of return at a time when long-term real interest rates are only 1 percent has a fair value equal to about 20 percent of pay. Public-sector accounting standards attach no value to this guarantee and, as long as these standards are used to guide Ottawa's compensation policies, the federal public sector will be materially overcompensated until interest rates return to their pre-2000 levels, something that is not expected anytime soon.

4. Recent Changes to the PSPP

Lahey's Findings

The *Lahey Report* acknowledged that the PSPP provided substantially better pensions than were typically found in the private sector and, more importantly, that there was no obvious justification for these superior pensions since salaries in the federal public sector were higher than salaries in the private sector. The *Lahey Report* made a number of suggestions to reduce pension costs including a gradual move to a 50/50 division of the current service cost and, perhaps, some increase in the retirement age.

Before looking at the federal government's response it is important to understand the size of the pension gap that Lahey might have imagined.

6 The table shows the impact that changing interest rates have on the fair value of pensions. It uses the plan provisions and employee data in the 2011 Report, not the plan provisions and the employee data at earlier points in time. The table is not a reconstruction of what the fair values would have been in the past. Instead, it shows how interest rate changes during the last 12 years would have impacted the fair value calculated at a specific point in time.

7 See the first *Commentary* in this series, "*Evaluating Public Sector Pensions: How Much Do They Really Cost?*," for a discussion of the value governments attach to the guarantees embedded in defined-benefit pension plans, and the impact this has on the value of pensions as a compensation element.

Table 2: Impact of Declining Interest Rates on Fair Values

Year	Long Term RRB Yield on March 31 (*Percent*)	Fair Value of Pension as a percentage of Pay[a]	Excess of Fair Value over the Current Service Cost as a percentage of Pay[b]
2002	3.68	22.4	2.1
2003	3.08	25.9	5.6
2004	2.39	30.7	10.4
2005	2.08	33.2	12.9
2006	1.59	37.7	17.4
2007	1.77	36.0	15.7
2008	1.67	36.9	16.6
2009	2.00	33.9	13.6
2010	1.56	38.0	17.7
2011	1.13	42.5	22.2
2012	0.52	50.0	29.7
2013	0.48	50.5	30.2

Notes:

a The method used to estimate the fair values is described in the Appendix. The method is approximate but the results coincide closely with the Chief Actuary's calculations of the 2017 current service cost at various interest rates as shown in Appendix 11 (Table 55) of the 2011 Report (OCA 2012).

b The current service cost in 2017 was originally estimated to be 20.3% of pay. The impact of recent amendments on this estimate will be addressed later.

Source: Author's calculations as described in Appendix.

The PSPP cost, according to the estimates given to Lahey, was about 12.3 percent of pay net of employee contributions. If we assume that:

- 20 percent of private-sector workers were in DB plans worth about 9 percent of pay (roughly 25 percent less than the 12.3 percent value that Lahey attached to the substantially superior PSPP);
- 25 percent of private-sector workers were in defined-contribution (DC) pension plans or group RRSPs worth about 5 percent of pay; and
- 55 percent of private-sector workers did not participate in a pension plan or group RRSP,

then private-sector pensions/RRSPs would have been worth about 3 percent of pay[8] and the gap

8 This rough estimate is probably too high but given the large gap between the PSPP and private-sector pensions, a lower estimate would not change the story.

between private-sector pensions and federal public-sector pensions would have been about 9 percent of pay.

The federal public sector does not resemble a cross-section of the private sector. Its workers are better educated and better paid. They are more heavily unionized. They work for a very large employer. In comparing public-sector to private-sector pensions, Lahey tended to focus on large private-sector employers with pension plans, not on small businesses without pension plans. Consequently the gap, as perceived by policymakers at the time, might have been closer to 4 or 5 percent of pay.

The Federal Response

Ottawa's pension changes since the 2002/2003 fiscal year appear to have addressed a compensation gap of about 4 to 5 percent of pay.

- Employee contribution rates were increased gradually from 4.5 percent/7 percent (on earnings below/above the YMPE) to 6.85 percent/9.2 percent in 2013 and will be further increased to an estimated 9.5 percent/11.6 percent in 2017.
- The pension on earnings up to the YMPE for each year of service has been increased from 1.3 percent to 1.375 percent.
- The age at which employees hired after 2012 can retire with an unreduced pension has been increased by zero to 5 years, depending on their age of employment.

In this analysis, I ignore the change to the age at which members qualify for unreduced pensions for the following reasons. First, since the change applies only to those hired after 2012, it will be many years before it has a material impact on the cost of pensions accruing in a year. Second, the savings are partially mitigated by the fact that employees hired after 2012 will contribute less under the 50/50 cost-sharing principle. Finally, the savings are difficult to estimate as they depend critically on the ages at which employees subject to the new rules will elect to retire and these won't be known with any precision until those hired after 2012 begin to retire in large numbers decades from now.[9]

Using the same actuarial basis that the federal government uses to fund the PSPP, past and proposed PSPP changes have reduced, or will reduce, the cost of pensions accruing under the plan (net of employee contributions) by an estimated 4.5 percent of pay, from 14.7 percent[10] to 10.2 percent by 2017 (Table 3).

At 10.2 percent of pay the anticipated cost of the PSPP will still be much higher in 2017 than the cost of private-sector pensions. However, judged by its own metrics the federal government appears to have taken steps to mitigate the cost of employee pensions. In particular, by 2017 employees will be contributing an extra 5 percent of pay for their pensions. The pensions themselves will be little changed.

9 Adding five years to the age-related retirement criteria will reduce the current service cost for members hired after 2012 by an estimated 2.4 percent of pay according to an update to the 2011 Report released on January 28, 2013 (OCA 2013). However, under the 50/50 cost-sharing regime one-half of the savings will be passed to members as a reduction in employee contributions. The estimated reduction in the employer current service cost is therefore only 1.2 percent of pay, and the related savings will materialize gradually over the next 30 years.

10 Since the 2002 Plan was estimated to cost 12.3 percent of pay in the 1999 Report (OCA 2001), not the 14.7 percent that the same plan is estimated to cost in 2017, other factors have increased the cost by 2.4 percent of pay. This is not surprising as much has changed between the 1999 and 2011 Reports; members are living longer than expected, the assumed rate of return on the pension plan is slightly lower, the work force has aged, etc.

Table 3: Cumulative Impact since the *Labey Report* of Pension Changes on the Cost of Benefits Expressed as a Percentage of 2017 Pensionable Earnings*

	2002 Plan	2017 Plan	Increase
	(Percent)		*(percentage points)*
Estimated Current Service Cost	19.9	20.3	0.4
Employee Contribution Rate	5.2	10.1	4.9
Estimated Employer Current Service Cost	14.7	10.2	-4.5

* For employees hired before 2013.

Source: OCA (2012, 2013) and author's calculations.

Table 4: Average Annual Rate of Increase in Personnel Expenses per Full-time Equivalent Employee – Fiscal Years 1999/00 to 2011/12

	Average Annual Rate of Increase in Compensation *(Percent)*
Federal Public Service	5.10
Provincial & Territorial	3.80
Canadian Business Sector	3.30

Source: PBO (2012).

Does increasing the employee contribution rate fix the compensation problem identified in the *Labey Report*? This question is not easily answered. According to Ottawa's own statistics (PBO 2012), personnel expenses in the federal public sector have been increasing more quickly than in the provincial public sector or in the business community (Table 4).

Unfortunately, "personnel expenses" includes items that should not properly be viewed as compensation. For example, the amortization of pension fund investment gains and losses, interest on unfunded post retirement insurance liabilities and other adjustments associated with the underwriting of pensions and benefits are considered personnel expenses but should not be considered compensation, as discussed in Section 5 of my earlier *Commentary*.

Laurin and Robson (2014) estimate that the rate of increase in wages, salaries and benefits (other than post-retirement benefits) per full-time equivalent employee averaged 3.5 percent per annum in the federal public sector during the decade ending with the 2012/13 fiscal year as compared to a 3.0 percent rate of increase in the business sector. Thus it appears that wages and salaries in the federal public sector have been increasing more quickly than in the private sector, but the gap between the two is difficult to estimate with much confidence.

If changes to the PSPP between the 2002/03 fiscal year and the 2017/18 fiscal year reduce total compensation by 4.5 percent of salary while wages and salaries in the federal public sector increase, say, 0.5 percent per annum faster than wages and salaries in the private sector, the compensation gap identified in the *Labey Report* is growing, not shrinking.[11]

Without better information on salary growth in the public and private sectors it is impossible to say whether Ottawa's pension changes have addressed, in whole or even in part, the compensation gap acknowledged in the *Labey Report*.

The Fair-Value Approach

So far we have examined the financial impact of recent changes to the PSPP using the government's preferred metric – the current service cost of pensions as determined by the Chief Actuary for funding purposes and used, with minor modifications, for financial reporting as well. The story is much different when viewed from a fair-value perspective.

Table 5 shows the estimated 2017 PSPP current service cost for the 2002 and 2017 Plans on different valuation bases.

The 4.1 percent real valuation interest rate is the one currently used by the federal government to assess the cost of the plan. The 3.7 percent real valuation interest rate is the real yield available on RRBs on March 31, 2002. The 1 percent real valuation interest rate corresponds to real yields at the time this *Commentary* was written in early 2014. The 2002 Plan refers to the PSPP design in the 2003 fiscal year; i.e., in the year examined by the *Labey Report*. The 2017 Plan refers to the PSPP design as it is expected to be in 2017 for members hired before 2013, once the recently announced changes have been fully implemented.

The first and fourth columns in Table 5 tell the story from the federal government's perspective. Increasing employee contribution rates will reduce the federal government's current service cost by an estimated 4.5 percent of pay.

The second, third and fifth columns tell the story from a fair-value perspective by looking at the impact that plan changes and interest rate changes have had on fair values.

Fair value of pensions, net of employee contributions, using 2002 interest rates and plan provisions:	16.7% of pay
Impact of interest rate changes	21.2% of pay (37.9%-16.7%)
Impact of plan changes	-4.0% of pay (33.9%-37.9%)
Fair value of pensions, net of employee contributions, using current interest rates and the 2017 plan provisions	33.9% of pay

Since the 2002/03 fiscal year, Ottawa has decided to increase employee pension contributions by about 5 percent of pay. Meanwhile, a very significant decline in real interest rates has driven up the fair value of the PSPP by about 20 percent of pay. As a consequence, the fair value of the PSPP, net of employee contributions, has doubled and the gap between pensions in the federal public sector and in the private sector, measured at fair value, is much larger today than it was in 2002.[12]

11 The 0.5 percent per annum salary difference compounds to a 7.8 percent salary difference over 15 years, more than enough to counteract the increase in pension contributions. Employees may be paying more for their pensions but, relative to private sector workers, they may have received a salary increase to pay for it.

12 The reduction in interest rates has also increased the fair value of private sector defined-benefit pension plans. However, since DB pension plans now cover less than 15 percent of the private sector workforce, the impact is relatively minor. Falling interest rates do not increase the fair value of DC pension plans.

Table 5: Estimated Current Service Cost of the PSPP in 2017

	2002 PSPP			2017 PSPP	
	(*Percent*)				
Real Valuation Interest Rate	4.10	3.70	1.00	4.10	1.00
Estimated Current Service Cost	19.9	21.9	43.10	20.3	44.0
Employee Contribution Rate	5.2	5.2	5.2	10.1	10.1
Estimated Employer Current Service Cost	14.7	16.7	37.9	10.2	33.9

Source: Author's calculations as described in Appendix.

5. Access to Tax-Sheltered Retirement Savings Opportunities

In the early 1990s, the federal government reformed the retirement savings system to give all Canadians reasonable access to tax-sheltered retirement savings opportunities. The most difficult challenge was to find a workable way to treat equally those who participate in DB pension plans, increasingly public-sector employees, and those who save through DC pension plans and RRSPs, predominantly private-sector employees. This was accomplished through a complicated set of rules and limits (the "pension adjustment" or PA rules) that had, at its core, a simple "factor-of-nine" concept – accruing a 2 percent pension in a DB plan is roughly equivalent to contributing 18 percent of pay to an RRSP.

Much has changed since the early 1990s. Real interest rates have fallen from 4 percent to 1 percent and people are living two or three years longer. Taken together, this means that the fair value of DB pensions has more than doubled since the PA system was calibrated without any meaningful change to the rules. To be fair, the rules initially favoured DC plan members, as the actuarial assumptions used to develop the factor of nine did not rely on the indefinite continuation of the high real interest rates that were common at the time. As interest rates dropped, the advantages initially enjoyed by DC plan members disappeared. During the last decade, as interest rates fell to, and remained at, levels not contemplated when the PA system was introduced, the rules have become exceedingly unfair to DC pension plan members and, by extension, very advantageous for DB plan members.[13]

To illustrate the extent of the inequity consider the fair value of the compensation that a PSPP member can shelter from tax. With real interest rates at 1 percent, the fair value of the PSPP pension is about 44 percent of salary. A member earning $75,000 per annum can contribute an additional 4.5 percent[14] of salary to an RRSP,

13 Pierlot (2008) and Pierlot and Siddiqi (2011) show the extent of Canadians' unequal access to tax-deferred retirement-income saving, depending on whether or not they are members of a public-sector DB pension plan.

14 The pension formula is 1.375% of earnings up to the YMPE, not 2%. This leaves RRSP room equal to $600 + 9 × (2% − 1.375%) = $600 + 5.625% of earnings up to the YMPE.

bringing the total amount sheltered from tax to 48.5 percent of salary. If we assume that the PSPP member in question contributes 10 percent of salary to the pension plan and, in the interest of simplicity, that the member's compensation consists entirely of salary and pension, then the member's total compensation, including the fair value of the pension, would be

$$\$75,000 \times (1.00 + 0.44 - 0.10) = \$100,500$$

and the amount that the PSPP member can shelter from tax is

$$48.5\% \times \$75,000 = \$36,375.$$

This is slightly more than 36 percent of the member's total compensation ($100,500) as compared to the 18 percent that an employee without a pension plan can contribute to an RRSP. Thus, measured at fair value, members of the PSPP can tax shelter twice as much as private-sector employees relying on RRSPs.

This is not the level playing field that Canadians were promised.

Using fair values to measure and control access to tax-sheltered retirement savings plans should not be controversial. Taxpayers are not permitted to transfer assets into or out of an RRSP, or to buy or sell RRSP assets, other than at fair value. If public-sector employees are allowed to earn large, indexed, fully guaranteed pensions at a time when real interest rates are around 1 percent, the only way to give private-sector workers an equal opportunity to tax-shelter their retirement savings is to increase significantly their retirement savings limits and, thereafter, to tie the higher limits to real interest rates and, perhaps, to life expectancies in some reasonable way.

6. JSPPS AND TARGET-BENEFIT PLANS

Addressing the Inequities

The easiest way to fix the compensation and tax inequities discussed in Sections 4 and 5 is to transfer some or all of the investment risk now borne by taxpayers to PSPP members. Many provincial pension plans have been doing this for decades.

Consider a PSPP member who earns $75,000 per annum. Suppose, for the purposes of this demonstration, that:

- the member contributes 10 percent of pay to the PSPP and
- the member accrues, each year, a pension with a current service cost equal to 20 percent of pay (using the Chief Actuary's best estimate of the future rate of return on the pension fund) and a fair value equal to 44 percent of pay using the real yield on long term RRBs.

The member's total compensation,[15] measured at fair value, would then be

$$\$75,000 + (44\% - 10\%) \times \$75,000 = \$100,500.$$

However, using public-sector accounting standards the member's total compensation would be

$$\$75,000 + (20\% - 10\%) \times \$75,000 = \$82,500.$$

Now, suppose that a comparable private-sector employee has a salary equal to $78,571 (for reasons that will soon become clear) and a group RRSP worth 5 percent of salary. The private-sector employee's total compensation would then be

$$\$78,571 + (5\% \times \$78,571) = \$82,500.$$

15 For simplicity, I assume that compensation consists entirely of salary and pension.

From the federal government's perspective, the employee's total compensation is exactly as it should be – equal to the total compensation of the private-sector comparator. The PSPP member has a better pension but this is appropriate once the employee's large pension contribution and smaller salary are taken into account.

The story is entirely different when told from a fair-value perspective. The PSPP member's total compensation, $100,500, exceeds the private-sector comparator by $18,000. To eliminate the gap would require a combination of salary reductions, pension contribution increases and/or pension benefit reductions totalling this amount.

Alternatively the gap could be addressed, in whole or in part, by transferring investment risk from taxpayers to plan members. In this instance the entire $18,000 gap arises from the difference between the fair value of the pension (44% × $75,000 = $33,000) and the value that the government places on the pension (20% × $75,000 = $15,000). As explained earlier, this is the fair value of guaranteeing PSPP members a 4.1 percent real rate of return on their deferred compensation at a time when real interest rates are only 1 percent. If the guarantee is eliminated, in whole or in part, the fair value of the pension can be reduced by up to $18,000.

Addressing the Guarantees

There are many ways to reduce or eliminate guarantees. I will consider only two. The first is by converting the PSPP to a Jointly Sponsored Pension Plan (JSPP) where employees are collectively responsible for 50 percent of the cost of the plan and for 50 percent of the risk. The second is by converting the PSPP to a target-benefit plan where the 20 percent contribution rate is fixed and the risks are borne entirely by members through adjustments, both positive and negative, to the pensions they receive.

Table 6 compares the impact that different remedies have on total compensation measured at fair value.

The impracticality of the first two remedies is self-evident. Large salary reductions and/or contribution increases would substantially reduce the employee's standard of living. The employee ends up devoting more than 32 percent of total compensation to retirement savings, well in excess of the amounts that private-sector employees voluntarily choose to save for retirement.

A 55 percent reduction in the value of the pension would require changes to both the formula and the ancillary benefits. For example, to maintain the employee contribution at 10 percent of pay would require:

- increasing the retirement age to 65;
- eliminating pension indexing; and
- cutting the pension granted for each year of service from 2 percent to 1.4 percent.

The PSPP is, from the employee perspective, not worth 44 percent of pay. As discussed in Section 6 of my previous *Commentary*, if the Certainty Equivalent Interest Rate is, say, 1.25 percent higher than the riskless rate, then the PSPP would be worth about 32 percent of pay to employees. Employees would see a $9,000 compensation gap, not the $18,000 gap that the taxpayer sees.

If employees attach a lower value to pension guarantees than do taxpayers, an effective compensation package is one that avoids guarantees. Otherwise, employees will believe that they are paid too little and/or taxpayers will believe that they are paid too much.

Converting the PSPP to a target-benefit plan closes the compensation gap in the least painful way (by removing an expensive guarantee that employees underappreciate) while simultaneously solving or mitigating some other problems. For example:

- If the PSPP is converted to a target-benefit plan, the fair value of the pension will drop from 44 percent of salary (33 percent of total compensation) to 20 percent of salary (18 percent of total compensation). When added to the available RRSP room, members can tax-shelter 22 percent of total compensation – reasonably

Table 6: Reduction in Total Compensation as a Result of Various Potential Remedies, Measured at Fair Value

Remedy	Reduction in Total Compensation (*Dollar*)
Cut salary by 17.9% to $61,600	18,000
Increase employee pension contribution by $18,000, to 34% of pay[a]	18,000
Cut the value of the pension by 55%	18,000
Move to a JSPP, with no other compensation changes	9,000
Move to a target-benefit plan, with no other compensation changes	18,000

Note:
a While this would fix the problem in theory, in practice it would exceed the limit on employee contributions set out in the Regulations under the *Income Tax Act*.

Source: Author's calculations.

close to the 18 percent available to those relying exclusively on RRSPs.

- Moving to a target-benefit plan also eliminates the interest sensitivity of fair values. The yield on long-term real return bonds has moved between 0.3 percent and 5.1 percent during the last 20 years. The corresponding range for the fair value of the current PSPP benefit is between 16 percent and 51 percent of pay. As long as the PSPP is a defined-benefit pension plan it will be difficult to manage the total compensation of federal employees as interest rates change. If the PSPP becomes a target-benefit plan the fair value of the pension benefit will be as stable as the legislated contribution rate.

7. Another Way to Close the Compensation Gap

If the federal government believes that it can guarantee a 4.1 percent real rate of return on the retirement savings of its own employees at no cost to taxpayers, then presumably it can do the same for other Canadians. For example, Ottawa could use the PSPIB, or some new federal entity, to issue GICs with, say, a 20-year term to maturity. These GICs would be available to registered pension plans (DB or DC) and to individual RRSPs. The GICs would guarantee investors a real rate of return equal to that used by the federal government to determine the cost of the pensions it promises to its own employees in accordance with public-sector accounting standards. Currently, that rate is 4.1 percent. It has remained between 4.1 percent and 4.25 percent since 2000.

Interest would be compounded and paid at maturity. The GICs would be redeemable periodically without penalty. For example, the issuer might agree to buy back a GIC on the fifth anniversary of its issue and every fifth anniversary thereafter. The investor would receive the present value of the amount due at maturity. The present value would be calculated at the rate guaranteed on newly issued GICs.

The money received from investors would be invested in exactly the same way as the funds held in the PSPP's pension fund. Any difference between the rate of return on the fund and the rate of return earned by investors would be collected from, or paid to, the federal government. In the long run, as long

as the Chief Actuary's assumptions turn out to be unbiased estimates of future pension fund returns, Ottawa's gains and losses should offset each other. As well, consistent with public-sector accounting principles, the cost of the guarantees for financial reporting purposes should be zero, not the very high cost measured at fair value.

This approach would allow all Canadians, not just those employed by the federal government, to enjoy high, guaranteed real returns on their retirement savings. These guarantees would reduce the fair value of the compensation paid to federal government employees because the guarantees would be available to all Canadians saving for retirement and hence would no longer be considered compensation for government employment. Moreover, since guarantees would also be offered to DC pension plan members and RRSPs, the tax inequities would be substantially reduced.

To be clear, I believe that guaranteeing above-market returns on the retirement savings of all Canadians would be a foolish, expensive and financially-dangerous undertaking, but no more so than the deal Ottawa now offers to its own employees.

8. Executive Pensions in the Federal Public Sector

The *Lahey Report* identified one group within the federal public sector whose cash compensation lagged the private sector – executives.

In the late 1990s Ottawa created the Advisory Committee on Senior Level Retention and Compensation to advise it on matters relating to executive compensation. The Advisory Committee has to date issued 14 reports, the most recent in 2011, each recommending pay ranges for managers after taking into account existing pay ranges, government policy and pay levels in the private sector.

The Advisory Committee takes a total compensation approach, acknowledging that government pensions and benefits are more generous than those in the private sector and, consequently, that cash compensation should be less in the federal public sector than in the private sector.

The Advisory Committee typically finds that the total compensation of the lowest federal executive level (EX-01s, with salaries below $120,000) is slightly less than the private-sector comparator while the total compensation for federal executives at the highest level (DM-02s with salaries typically between $200,000 and $310,000) is less than one-half of their private-sector counterparts.

To reach its conclusions, the Advisory Committee must value the pensions earned by government and private-sector executives. While the committee apparently relies on external consultants for these values, the consultants' reports are not publicly available and the Advisory Committee's reports disclose next to nothing about the methods and assumptions supporting the values.

The pensions earned by federal public-sector executives are more valuable than the pensions earned by other federal employees for the following reasons:

- Senior managers are older and better paid than other employees, both of which increase current service costs as a percent of pay;
- Executives usually live longer than other employees;
- While executives participate in the PSPP and earn similar benefits to other employees, any pension payable on earnings over about $150,000 must be delivered through an RCA to comply with the *Income Tax Act*. These pensions will be more expensive than pensions delivered through a registered pension plan due to the 50 percent refundable tax on RCA contributions and investment income;
- Some executives receive special benefits not available to rank-and-file public servants. In particular:
    - deputy ministers receive two years of credited service for each of their first 10 years of service as a deputy minister, effectively doubling their benefit and more than doubling the cost of their benefit, and

- department heads who leave the government are permitted to accrue benefits after their termination as if they were continuing in employment, provided that they contribute to the RCA twice the normal employee contribution to the PSPP. In addition to the full deductibility of their RCA contribution, such an employee can participate in the registered pension plan of another employer or, alternatively, make maximum RRSP contributions.

Table 7 estimates the fair values of pensions accruing to executives at the EX-01 and DM-02 levels.[16] Since neither the actuarial report for the PSPP nor the Advisory Committee's reports provide comparable values, there are no publicly disclosed amounts with which to compare these estimates.

Table 7 should be interpreted as follows for DM-02s:

- The government's estimate of the current service cost of the PSPP, net of employee contributions (at the 2011 level), is 12.7 percent of pay.
- DM-02s are older, paid more and can be expected to live longer than other PSPP members. The estimated adjustment for these factors is 3.2 percent of pay.
- DM-02s, with salaries (including salaries "at risk") around $260,000 per annum, will receive close to 40 percent of their pensions outside a tax shelter. This will add about 7.8 percent of pay to the cost of their pensions.
- The "two-for-one" provision adds 44.9 percent of pay to the cost of the pension. This feature is very expensive because it doubles the benefit without doubling the employee contribution and the additional benefit is delivered outside the tax-sheltered registered pension plan, which increases the fair value of the pension.
- Finally, moving from the PSPP discount rate (4.1 percent real) to the current yield on RRBs (approximately 1 percent real) adds another 43.6 percent of pay to the cost of their pensions.[17]

The total, after all the adjustments, comes to 112.2 percent of pay net of the DM-02's own contribution.

Finally, the estimated cost at fair value of allowing a DM-02 to accrue pensions for a year after leaving the government's employ (assuming the "two-for-one" rule does not apply to post-employment accruals) is estimated to be 49.5 percent of pay, net of employee contributions at double the normal rate.

Pensions are an important part of the compensation of executives employed by the federal government, deputy ministers in particular. The latest Advisory Committee report (OCHRO 2011) included the following breakdown of total compensation for EX-01s.[18]

	(Percent)
Base Pay	71.30
At risk pay	8.60
Pension	8.30
Other Benefits	11.80
Total	**100.00**

By inference, the Advisory Committee believes that EX-01 pensions have a value somewhere between 10 percent and 12 percent of pensionable earnings, depending on whether "at-risk" pay counts as pensionable earnings. This is much less than the fair value of these pensions.

16 The fair value for DM-02s has been determined assuming that the DM-02 has not completed 10 years of service as a deputy minister and hence qualifies for the "two-for-one" bonus.

17 The real, after-tax discount rate used to value pensions over the ITA limits drops from 1.2 percent (4.1% – 46% × (4.1% + 2.3%)) to -0.5 percent (1.0% - 46% × (1.0% + 2.3%)).

18 http://www.tbs-sct.gc.ca/rp/adcm14-eng.asp#Fig2.

Table 7: Fair-Value Estimates of the Pensions Accruing to Federal Executives, as a Percentage of Salary

	EX-01	DM-02
	(*Percent*)	
Employer current service cost for the PSPP	**12.7**	**12.7**
Increase in current service cost due to…		
differences in salary, age and assumptions	2.5	3.2
adjustment for pensions in excess of *ITA* limits[a]	0.0	7.8
Two-for-one adjustment	0.0	44.9
fair-value adjustment	20.8	43.6
Estimated employer current service cost @ fair value	**36.0**	**112.2**
Estimated cost for one year of post termination accrual	**#N/A**	**49.5**

Notes:

a All pensions in excess of the ITA limits are valued using an "after tax" nominal discount rate equal to 54% of the nominal discount rate used to calculate the fair value of pensions that can be delivered through a tax shelter. This assumes that
- the fair value is the amount that it would cost an employee to replicate the pension by investing in RRBs outside a tax shelter, and
- the typical DM-02 lives in Ontario and is taxed at the 46% maximum marginal tax rate (ignoring the higher marginal rate recently introduced for those earning more than $500,000 per annum).

Source: Author's calculations as described in Appendix.

To conclude on this point:

- Federal executive pensions are more valuable than the pensions provided to other employees.
- Based on the public disclosures of the Advisory Committee, it is impossible to say whether pensions are being properly valued in comparisons with the private sector, although it appears that they are not.
- If pensions have been mispriced in the Advisory Committee's analysis, then its conclusions may also be in doubt – specifically (1) the finding that lower-level executives are paid slightly less than their private-sector counterparts and (2) the determination that deputy ministers are paid less than one-half the amounts paid to their private-sector counterparts.[19]

In fairness, the Advisory Committee recently expressed an interest in better understanding the values placed on pensions in the analysis supporting its conclusions. The following appears as one of the "Topics of Focus for the Future" identified in its 2010 report.

19 Since many of the private sector executives to whom government executives are compared will be members of DB pension plans, and since these DB plans are likely mispriced in the same way that the federal government's pension plans are mispriced, any correction will increase both the total compensation of federal executives and the benchmarks to which they are compared, but not by the same amounts.

> We recognize that the value of the Public Service Pension and Benefits Plans as a part of the total compensation package is not well understood and wish to gain more information on the valuation of the Public Service Pension Plan, in particular from a total compensation perspective.

No reference to this initiative appears in the 2011 report (OCHRO 2011).

9. CONCLUSION

The federal government appears to believe that pay in the federal public sector should be comparable to pay in the private sector on a total compensation basis. The *Labey Report* and the Advisory Committee's reports are generally consistent with this view.

To implement this principle, pensions must be valued appropriately. The author believes that fair values are the best measure of a pension plan's worth in a transaction where employees provide their labour in exchange for compensation that includes a valuable pension. However, governments appear not to apply fair value principles, preferring instead to use cost estimates developed for the funding of pension plans or for financial reporting in accordance with public-sector accounting standards. While the differences between fair values and funding estimates were not significant in the 1980s and 1990s when interest rates were high, the differences today are exceedingly large.

It is undeniably more convenient for the federal government to continue to use the numbers it has been using. But it is also wrong, for to do so is to collectively guarantee federal employees a 4.1 percent real rate of return on their retirement savings at a time when other Canadians must accept a 1 percent guarantee if they seek one or, alternatively, must bear significant investment risks in pursuit of a 4.1 percent real rate of return. These guarantees are very advantageous yet public-sector accounting standards attach no value to them and the federal government appears to ignore them when assessing the reasonableness of employee compensation.

How can this be? The culprits appear to be actuarial and accounting standards that are incompatible with market prices.

The actuarial profession has no standard that directly addresses the valuation of pension benefits for compensation purposes. There is a standard for valuing pensions for funding purposes and there are separate standards for valuing pensions that are commuted upon termination of employment or that form part of family property when a marriage ends.

In his 2011 Report (OCA 2012), the Chief Actuary writes:

> The purpose of this actuarial valuation is to determine the state of the Public Service Superannuation Account, Pension Fund and Retirement Compensation Arrangements Accounts as well as to assist the President of the Treasury Board in making informed decisions regarding the financing of the government's pension benefit obligation.

In other words, the Chief Actuary's intent is to provide information on the funding of the PSPP, not to estimate pension costs for compensation-setting purposes. Others, including other actuaries, can use the Chief Actuary's funding numbers for compensation management purposes. Strictly speaking, the Chief Actuary has not condoned this use of his numbers nor has he explicitly distanced himself from it. In the absence of professional standards addressing the valuation of pension benefits for compensation management purposes, actuaries and others practising in the field are working in a vacuum.

The commuted-value and marriage-breakdown standards are more consistent with fair-value principles. In these cases, pensions are discounted at market interest rates with no regard for the funded status of the pension plan or the investment policies of the pension fund.

Commutations and property divisions on marriage breakdown are considered transactions. Since compensation is also a transaction, it would make sense to use fair values there as well, but

no standard requires this and many actuaries find that the convenience associated with readily available, stable funding estimates outweighs other considerations. They prefer estimates that are stable and wrong to estimates that are volatile and right.

Public-sector accounting standards are the responsibility of the Public Sector Accounting Board (PSAB), an independent body appointed by the Accounting Standards Oversight Council, also an independent body.

At the present time the PSAB has 12 members, 11 of whom appear to be members of public-sector pension plans and/or involved in the preparation of public-sector financial statements. The 12th provides accounting services to public-sector organizations. By education, training and experience, the board members are well qualified for the duties they perform. No doubt they are accomplished and respected professionals doing a difficult and sometimes thankless job with integrity. And yet there is something inherently wrong with a system where members of public-sector pension plans decide how the cost of these plans should be measured and disclosed to the public they serve. It is not unlike having executive compensation disclosures decided by a committee consisting entirely of highly paid executives.

The PSAB is aware that the financial reporting for public-sector pensions is controversial. Indeed, the February 2012 issue of its periodic bulletin, *PSAB Matters*, sets out the board's most recent position on pension accounting. The PSAB appears to accept that changes are required.

> Recent changes to pension standards introduced by others also reveal inconsistencies between the pension accounting model and the general accounting and financial reporting principles that apply to other transactions and financial statement items. PSAB is also aware of the criticism on the discount rate(s) generally used in the Canadian public sector in determining pension benefit obligations and the related implications.
>
> PSAB acknowledges the need to reconsider its pension standards, which share many of the shortcomings of the current pension accounting model in others' standards (PSAB 2012).

However, there is no sense of urgency.

> The Board discussion led to the conclusions that although PSAB's existing pension accounting standards can be improved, there is no immediate need for change. Updating the standards at a later time would be more desirable due to other related developments, such as the current Concepts Underlying Financial Performance project, changes to the types of public-sector pension arrangements being considered, a review of the employee future benefits accounting model by other standard setters, PSAB's other priorities, and availability of staff resources.
>
> The Board agreed to monitor the development of changes in plan designs and activities of other standard setters. The appropriate time to undertake a project will be further considered when major changes emerge (PSAB 2012).

In apparent contrast, the PSAB's mission statement includes the following words.

> The mission of PSAB is to contribute to supporting informed decision-making and accountability by maintaining a framework that provides a basis for high-quality information about organizational performance reported by Canadian public-sector entities (PSAB 2012).

It is hard to see how a financial reporting standard that allows the federal government to report pension costs that are less than one-half the fair values of the pensions in question is providing "a basis for high-quality information about organizational performance." More importantly, it is impossible to see how this kind of information supports informed decision making or accountability. We are talking about an accounting standard that attaches no value to a government guaranteeing

lifetime returns 3 percentage points above market interest rates on $4 billion of pension contributions each year.

According to the 2011 Report, the payroll for PSPP members was expected to exceed $20 billion in 2012. This means that the current service cost for one pension plan sponsored by one government in one year was $4 billion below fair value. As a consequence, the federal government underestimated the 2012 compensation of these members by $4 billion and reached a long list of erroneous conclusions about the cost of its pension plans and the compensation of its employees.

Actuarial and accounting standards do not explicitly advocate or endorse the use of funding or accounting numbers in compensation studies but the standards-setting bodies and the professionals involved know, or ought to know, that numbers prepared for one purpose are being used for other purposes to which they are ill-suited. In this sense, actuarial and accounting standards have become the enablers of bad financial practice even though the standard-setting bodies do not advocate or condone bad practice.

Given the amounts involved something should be done about this – and done soon.

APPENDIX: THE METHOD USED TO ESTIMATE CURRENT SERVICE COSTS FOR THE PSPP

I have estimated the current service cost[20] of the PSPP for a variety of interest rates and, in some instances, for plan provisions that existed on specific dates in the past or that might exist on specific dates in the future. This Appendix describes the methods used to produce these estimates.

This *Commentary* looks only at current service costs. There are no estimates of accrued liabilities. None were needed as the *Commentary* focuses on the current and future compensation of PSPP members, not on the PSPP's funded status.

The Actuarial report for the PSPP as at March 31, 2011 (OCA 2012) provides an excellent description of the plan, its membership and the methods and actuarial assumptions employed by the Chief Actuary in arriving at his estimates of the current service cost. The Chief Actuary's estimates of the 2017 current service cost calculated at six different interest rates are available at Table 55 on page 70 of the report.

I created a spreadsheet that calculated the current service cost for a PSPP member hired at age 32 and earning $75,000 in 2011. The calculations were done using the 2011 YMPE. They were based on the following actuarial assumptions, all of which are reasonably consistent with the assumptions and/or data described in the Chief Actuary's report.

Inflation Rate	2.3%
Rate of Salary Growth	4.8%, including 1.3% for seniority
Rate of Increase in the YMPE	3.6%
Mortality Table (post retirement)	96% of the UP94 generational table
Male	45%
Married	90%

The plan provisions were those described in the report (OCA 2012).[21] The spreadsheet calculated the member's current service cost for the six interest rates as a function of the assumed attained age and assumed retirement age. The "Solver Add-in" was then used to find the attained /retirement age combination that did the best job of reproducing the Chief Actuary's estimated current service costs. The optimal combination was:

20 The current service cost for a particular year is the estimated present value of the benefits earned by members for service in that year. It is calculated using the actuarial methods and assumptions described in actuarial reports and the employee data summarized in these reports. For example, see OCA (2012).

21 The plan provisions are unchanged except for the member contribution rate (which does not materially affect the total current service cost) and the early retirement provisions that were changed after the 2011 report was released. The early retirement changes were addressed in an update to the report released in 2013.

- an assumed attained age (i.e., the age of the member in 2017) of 49, and
- an assumed retirement age of 62.75.

This combination produced current service costs that were quite close to the Chief Actuary's estimates, as can be seen from the following table.

Current Service Cost (*Percent*)			
Real Interest Rate	**Actual**	**Estimated**	***Error*** *(percentage points)*
2.70	28.40	28.46	0.06
3.10	25.70	25.80	0.10
3.40	23.90	24.00	0.10
3.80	21.80	21.82	0.02
4.10	20.30	20.33	0.03
4.50	18.60	18.53	-0.07

While the approximation is very good for the current plan design and for interest rates between 2.7 percent and 4.5 percent, no simple model will do as good a job for interest rates outside this range or for plan designs that differ significantly from the current plan. The estimates at very low interest rates (as low as 0.3 percent) and the estimates for a radically changed pension plan (for example, the estimated cost of a plan with a 1.4 percent unit benefit, no indexing and retirement at 65) will likely differ from a better estimate by several percentage points, but differences of this order of magnitude would not alter the narrative of this *Commentary* or its conclusions.

Finally, the estimated current-service costs for executives are, of necessity, even more approximate due to the scarcity of publicly available information. The calculations were done for a 52-year-old executive who retires at age 60. The assumed mortality rates were reduced by 20 percent and the "seniority" component of the assumed rate of growth in salaries (1.3 percent per annum) was eliminated. Otherwise the assumptions were generally consistent with those in the actuarial report.

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